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Docket No.: 1344.1021

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Hideyuki MIYATA, et al.

Serial No. 09/272,404 Group Art Unit: 2633

Confirmation No. 5584

Filed: March 19, 1999 Examiner: Agustin Bello

For: OPTICAL TRANSMISSION APPARATUS AND METHOD WHICH ADJUST RISE AND FALL TIME OF SIGNAL LIGHT TO BE TRANSMITTED

APPEAL BRIEF

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

A Notice of Appeal was filed on June 24, 2004, and provided a two-month period for response which expired on August 24, 2004. A Petition and fee was a one-month extension of time was filed concurrently herewith, thereby extending the time period for response to September 24, 2004.

Therefore, it is respectfully requested that this Appeal Brief be entered and considered.

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I. REAL PARTY IN INTEREST

The real party in interest is Fujitsu Limited, as evidenced by an Assignment recorded on April 28, 1999, at reel/frame 9933/0211.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals, interferences or judicial proceedings known to appellant, the appellant's legal representative, or assignee.

III. STATUS OF CLAIMS

Claims 2-4, 9-10, 21, 30, 34 and 36 have been canceled.

Claims 1, 5-8, 11-20, 22-29, 31-33, 35 and 37-39 are the only pending claims. All these pending claims are rejected.

An Appendix is attached hereto, and lists each of the pending claims in their current form, along with an indication of the status of the claim.

IV. STATUS OF AMENDMENTS

All filed Amendments have been entered.

More specifically, there are no unentered Amendments After Final.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention as recited, for example, in independent claim 16, relates to an apparatus comprising an adjusting circuit and a modulator. The adjusting circuit adjusts at least one of a rise time and a fall time of an electrical modulation signal. The modulator modulates a light with the adjusted electrical modulation signal. Moreover, as recited in claim 16, the adjusting circuit adjusts at least one of the rise time and the fall time in accordance with characteristics of the modulated light as received by a receiver through an optical transmission path. See, for example, FIG. 1 and the corresponding disclosure on page 7, line 4, through page 10, line 3, of the specification; and FIG. 10 and the corresponding disclosure on page 18, line 27, through page 19, line 22, of the specification. See especially the operation of adjusting circuit 13 and modulator 14 in FIGS. 1, 8 and 10.

Each of the other independent claims 1, 26, 28, 33, 35, 37, 38 and 39, recite features

which are somewhat similar to those recited in claim 16, relating to the adjustment of at least one of a rise time and a fall time of a modulation signal in accordance with characteristics of a modulated light at a receiver. Therefore, it is respectfully submitted that each independent claim can be understood, for example, from FIG. 1 and the corresponding disclosure on page 7, line 4, through page 10, line 3, of the specification; and from FIG. 10 and the corresponding disclosure on page 18, line 27, through page 19, line 22, of the specification. See especially the operation of adjusting circuit 13 and modulator 14 in FIGS. 1, 8 and 10.

Independent claims 38 relates to wavelength division multiplexing. More specifically, independent claim 38 recites a plurality of transmitting devices, each comprising (a) a light source emitting a light, (b) a modulation signal generator generating an electrical modulation signal having a corresponding rise time and fall time, (c) an adjusting circuit adjusting at least one of the rise time and fall time of the electrical modulation signal, and (d) a modulator modulating the emitted light with the adjusted electrical modulation signal, the emitted light of each light source being at a different wavelength than the emitted light of the other light sources so that the plurality of transmitting devices thereby produce a plurality of modulated lights, respectively, at different wavelengths. Moreover, claim 38 recites an optical multiplexer multiplexing the plurality of modulated lights into a wavelength division multiplexed (WDM) light. As recited in claim 38, in each transmitting device, the adjusting circuit of the respective transmitting device adjusts at least one of the rise time and fall time in accordance with characteristics of the modulated light of the respective transmitting device at a receiver receiving the respective modulated light from the WDM light. Claims 15 and 39 recite somewhat similar features. See, for example, FIGS. 8 and 10, and the disclosure on page 14, line 22, through page 16, line 20; and on page 19, lines 9-22, of the specification. See especially the operation of adjusting circuit 13 and modulator 14 in FIGS. 8 and 10.

Dependent claims 6 and 8 recite that the adjusting circuit lengthens both the rise time and the fall time. See, for example, adjusting circuit 13 in FIGS. 1, 8 and 10, and the disclosure on page 17, lines 3-5, of the specification.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Rejection of claims 1, 5-8, 11-12, 15-20, 22, 25-29, 31-33, 35 and 37-39 under 35 USC 103 as being unpatentable over Marcuse (USP 5,608,561) in view of Clow (USP 6,005,561)

B. Rejection of claims 13, 14, 23 and 24 under 35 USC 103 as being unpatentable over Marcuse in view of Clow and Chraplyvy (USP 5,420,868)

VII. ARGUMENT

A. Rejection of claims 1, 5-8, 11-12, 15-20, 22, 25-29, 31-33, 35 and 37-39 under 35 USC 103 as being unpatentable over Marcuse (USP 5,608,561) in view of Clow (USP 6,005,561)

1. Claims 1, 5, 7-8, 11-14 and 16-17, 19-20, 21-27 and 33 should be grouped together

The present invention as recited, for example, in independent claim 16, relates to an apparatus comprising an adjusting circuit and a modulator. The adjusting circuit adjusts at least one of a rise time and a fall time of an electrical modulation signal. The modulator modulates a light with the adjusted electrical modulation signal. Moreover, as recited in claim 16, the adjusting circuit adjusts at least one of the rise time and the fall time in accordance with characteristics of the modulated light as received by a receiver through an optical transmission path.

See, for example, FIG. 1 and the corresponding disclosure on page 7, line 4, through page 10, line 3, of the specification; and FIG. 10 and the corresponding disclosure on page 18, line 27, through page 19, line 22, of the specification. See especially the operation of adjusting circuit 13 and modulator 14 in FIGS. 1, 8 and 10.

Marcuse discloses that pulse rising and falling times of a transmitted pulse can be reduced, to thereby reduce modulator chirp of an optical modulator. Thus, Marcuse specifically relates to reducing modulator chirp which is defined by Marcuse as excess spectral broadening imparted by the modulator. See, for example, column 6, lines 25-27, of Marcuse.

On page 2 of the outstanding Final Office Action, the Examiner admits that Marcuse does not specifically teach that changes are made in accordance with characteristics of the signal light at a receiver. However, the Examiner asserts that such operation would be obvious in view of Marcuse, or obvious in view of Marcuse in combination with Clow.

In Marcuse, the rise time and fall time are fixed after being initially set. No portion of Marcuse discloses or suggests that the rise time and fall time are subsequently adjusted after being initially set.

For example, column 5, lines 61-65, of Marcuse, describes "... a modulator 130 having a 10 GHz bandwidth can be used to produce a modulated light signal 135 having decreased pulse transition times compared ...". In view of this portion, it is respectfully submitted that the bandwidth of modulator 130 which determines the rise time and fall time of the modulated light signal 135 is fixed to be 10 GHz. FIG. 2 and column 6, lines 35-37, of Marcuse, discloses an example of an RC circuit as a configuration of filter 16 used for a driver 110. In such a known RC circuit, the rise time and fall time are fixed at previously set values.

Moreover, as Marcuse relates to reducing modulator chirp, Marcuse does not seem so concerned with the signal light as received by a downstream receiver.

Therefore, it is respectfully submitted that the adjusting of the rise time and/or fall time in accordance with characteristics of the signal light at the receiver would not be obvious in view of Marcuse, by itself.

* * *

Clow relates to transmission of electrical signals through a coaxial cable, wire pair, or other type of "wire" transmission path. See, for example, column 1, lines 31-38; column 2, lines 30-62; and column 3, lines 46-51, of Clow. Therefore, it should be understood that Clow relates to transmission through a "wire" transmission path, such as a coaxial cable or wire pair. By contrast, the claimed invention relates to transmission through an "optical" transmission path.

On page 8 of the outstanding Final Office Action, the Examiner asserts that "although Clow teaches that his system can be used with a 'wire' transmission path, Clow also teaches that the type of transmission medium is not limited, thereby suggesting that it could be used with other types of mediums, including an optical medium".

It should be noted that, for example, column 3, lines 51-52, of Clow, indicate that "It will be understood that the type of transmission medium is not a limitation of the present invention"

However, this portion of Clow relates to the proceeding sentence in Clow, indicating that Clow relates to "wire cable including coaxial cable, twisted pair ribbon cable or parallel extending wire conductors". Each of these examples is a "wire" type of transmission path. Moreover, the entire disclosure in Clow is directed to specific problems of a "wire" type of transmission path. For example, column 1, lines 14-19, relate to characteristics of "cable or wire transmission lines". Column 2, line 30, through column 3, line 2, of Clow, discuss specific problems relating to crosstalk, capacitive coupling, t-taps, branching, and line impedance" of "wire" type transmission paths.

Therefore, it is respectfully submitted that Clow is specifically directed to "wire" type transmission paths, and the problems associated with such transmission paths. Accordingly, although, for example, column 3, lines 51-52, of Clow, indicate that "It will be understood that the type of transmission medium is not a limitation of the present invention", it is respectfully submitted that this portion of Clow simply indicates that Clow is not limited to any particular type of "wire" transmission path.

It is respectfully submitted that no portion of Clow discloses or suggests that Clow is applicable to an "optical" transmission path, and that no portion of Clow discusses problems related to an "optical" transmission path.

For these reasons, it is respectfully submitted that Clow should not be combined with Marcuse. Moreover, for these reasons, it is respectfully submitted that, even if Clow was combined with Marcuse, the combination would not disclose or suggest the claimed invention.

* * *

Further, it should be understood that Clow relates to transmission of "electrical" signals (NOT light). By contrast, the claimed invention relates to the transmission of "light".

For this reason, it is respectfully submitted that Clow should not be combined with Marcuse. Moreover, for this reason, it is respectfully submitted that, even if Clow was combined with Marcuse, the combination would not disclose or suggest the claimed invention.

* * *

Further, Clow does not include any disclosure indicating that a carrier or modulator is involved. Instead, it appears that Clow directly transmits an information signal through the wired transmission path, without using a carrier or modulator. For example, various portions of Clow indicate that, by adjusting the rise time or fall time, the transmission rate through the wired

transmission path is increased or decreased, thereby indicating a direct transmission of the information signal through the wired transmission path. See, for example, the last line of the Abstract; column 1, lines 62-64; column 2, lines 9-14; column 5, lines 8-27; column 5, lines 3942, of Clow. See also, for example, FIGS. 2 and 3 of Clow.

More specifically, as indicated in column 4, lines 30-34, of Clow, "the processor 16a, upon receipt of feedback information is then able to adjust one or more parameters of the transmitted signals on the link 12 ...". Therefore, in Clow, the parameters (such as the rise time and the fall time) of the transmitted signals themselves on the transmitting medium (link 12) are adjusted.

Such type of direct transmission in Clow is common, for example, in transmissions over a relatively short distance.

By contrast, the present invention as recited in claim 16 relates to the adjusting of the rise time and/or fall time of an "electrical modulation signal" which is used to modulate a light (i.e., a carrier). Therefore, claim 16 relates to adjustment of the modulation signal used to modulate a carrier light. The modulated light (i.e., the modulated carrier) is then transmitted through a transmission path. As indicated above, Clow does not disclose or suggest the use of a carrier. Therefore, the fundamental nature of the transmission in Clow is significantly different than that in the claimed invention.

On page 8 of the outstanding Final Office Action, the Examiner asserts that FIGS. 2-6 of Clow clearly show that a carrier or modulator is involved. However, it is respectfully submitted that it is not clear from these figures whether a carrier or modulator is involved. These figures simply show a drive waveform. It is unclear whether the drive waveform represents a modulated carrier, or an information signal by itself.

For these reasons, it is respectfully submitted that, even if Clow was combined with Marcuse, the combination would not disclose or suggest the claimed invention.

* * *

Moreover, as indicated above, in Marcuse, the rise time and fall time are fixed after being initially set. No portion of Marcuse discloses or suggests that the rise time and fall time can be subsequently adjusted after being initially set. Therefore, it is respectfully submitted that the optical modulator of Marcuse should not be combined with the adjustment of a rise time and/or fall time in Clow.

* * *

Further, as indicated above, Clow specifically relates to addressing problems occurring in "wire" transmission paths. For example, column 2, line 30, through column 3, line 2, of Clow, discuss specific problems relating to crosstalk, capacitive coupling, t-taps, branching, and line impedance" of "wire" type transmission paths. These types of problems are specifically directed to "wire" transmission paths. It is respectfully submitted that no portion of Clow indicates that the invention of Clow would solve problems associated with optical transmission paths. Therefore, it is respectfully submitted that the optical modulator of Marcuse should not be combined with the adjustment of a rise time and/or fall time in Clow.

* * *

As indicated above, Marcuse relates to reducing modulator chirp of an "optical" modulator. By contrast, Clow relates to transmission of electrical signals through a coaxial cable, wire pair, or other type of "wire" transmission path. Therefore, Marcuse relates to optical technology and optical transmission, and Clow relates to electrical technology and electrical transmission.

Moreover, Marcuse and Clow are categorized in different art classifications by the USPTO, as indicated on the front pages of the patents. Also, this is no overlap in the categories of the "Field of Search" as listed on the front pages of the patents.

For these reasons, and in view of other arguments presented further above, it is respectfully submitted that Marcuse and Clow should be considered non-analogous art for the purpose of this rejection.

* * *

In accordance with the above, it is respectfully submitted that Marcuse should not be combined with Clow. Moreover, in accordance with the above, it is respectfully submitted that, even in Marcuse was combined with Clow, the combination would not disclose or suggest the claimed invention.

* * *

2. Claims 28-29, 31-32, 35 and 37 should be grouped together

Claim 28 recites the adjustment of at least one of a rise time and a fall time of a "modulation signal". This recitation is slightly different than the recitation of an "electrical modulation signal" of, for example, claim 16. For this reason, claim 28, and the other claims in the corresponding group, are grouped differently than claim 16.

3. Claims 6 and 18 should be grouped together

Claims 6 and 18 recite that the adjusting circuit LENGTHENS both the rise time and the fall time.

See, for example, adjusting circuit 13 in FIGS. 1, 8 and 10, and the disclosure on page 17, lines3-5, of the specification.

Marcuse simply discloses that rising and falling times can be REDUCED. Moreover, Marcuse is specifically directed to reducing modulator chirp. For this purpose, the rise and fall times must be reduced, as described in Marcuse. If the rise time and/or fall time were lengthened, it is respectfully submitted that such operation would increase modulator chirp. Therefore, the lengthening of the rise time and fall time would be contrary to Marcuse.

Accordingly, it is respectfully submitted that the lengthening of the rise time and/or fall time should not be considered obvious in view of Marcuse by itself. Moreover, it is respectfully submitted that any lengthening in Clow should not be combined with Marcuse, as such lengthening would be contrary to Marcuse.

In view of the above, it is respectfully submitted that claims 6 and 18 are patentable over the Marcuse and Clow, taken individually or in combination.

4. Claims 38, 39 and 15 should be grouped together

Independent claim 38 recites a plurality of transmitting devices, each comprising (a) a light source emitting a light, (b) a modulation signal generator generating an electrical modulation signal having a corresponding rise time and fall time, (c) an adjusting circuit adjusting at least one of the rise time and fall time of the electrical modulation signal, and (d) a modulator modulating the emitted light with the adjusted electrical modulation signal, the emitted light of each light source being at a different wavelength than the emitted light of the other light sources

so that the plurality of transmitting devices thereby produce a plurality of modulated lights, respectively, at different wavelengths. Moreover, claim 38 recites an optical multiplexer multiplexing the plurality of modulated lights into a wavelength division multiplexed (WDM) light. As recited in claim 38, in each transmitting device, the adjusting circuit of the respective transmitting device adjusts at least one of the rise time and fall time in accordance with characteristics of the modulated light of the respective transmitting device at a receiver receiving the respective modulated light from the WDM light. Claims 15 and 39 recite somewhat similar features. See, for example, FIGS. 8 and 10, and the disclosure on page 14, line 22, through page 16, line 20; and on page 19, lines 9-22, of the specification.

On page 5 of the outstanding Final Office Action, the Examiner acknowledges that the combination of Marcuse and Clow do not suggest a plurality of transmitters and an optical multiplexer. However, the Examiner asserts that it would have been obvious to one of ordinary skill in the art to replicate the device of Marcuse so that each of lasers produces a distinct wavelength, then multiplexing those distinct wavelengths via a wavelength division multiplexer to produce a wavelength division multiplexed signal.

However, it is respectfully submitted that no portion of Marcuse or Clow specifically relates to wavelength division multiplexing. Moreover, no portion of Marcuse or Clow discloses any particular problems of wavelength division multiplexing that would be solved by the combination of Marcuse with Clow. Further, neither references indicates any reasons why the references should be combined in the manner suggested by the Examiner, and then applied in a wavelength division multiplexing environment.

Further, neither Marcuse or Clow discloses how the technology described in Marcuse or Clow would be modified for a wavelength division multiplexed environment. For example, claim 38 specifically recites adjusting at least one of the rise time and fall time in accordance with characteristics of the modulated light of the respective transmitting device at a receiver receiving the respective modulated light from the WDM light. As neither Marcuse or Clow relates to wavelength division multiplexing, neither references disclose or suggests that a respective modulated light from the WDM light is detected, or that a rise time and/or fall time would be adjusted in accordance with such a detected light.

* * *

In view of the above, it is respectfully submitted that the rejection is overcome.

B. Rejection of claims 13, 14, 23 and 24 under 35 USC 103 as being unpatentable over Marcuse in view of Clow and Chraplyvy (USP 5,420,868)

The comments above for distinguishing over Marcuse and Clow also apply here, where appropriate.

In view of the above, it is respectfully submitted that the rejection is overcome.

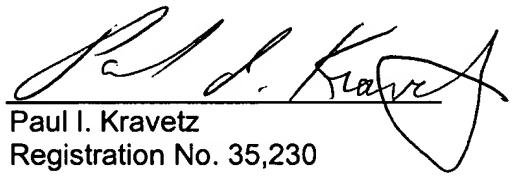
VIII. CONCLUSION

In view of the above, it is respectfully submitted that the application is in condition for allowance, and a Notice of Allowance is earnestly solicited.

If any further fees are required in connection with the filing of this Appeal Brief, please charge such fees to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: September 24, 2004 By: 

Paul I. Kravetz
Registration No. 35,230

1201 New York Ave, N.W., Suite 700
Washington, D.C. 20005
Telephone: (202) 434-1500
Facsimile: (202) 434-1501

APPENDIX

The following is a listing of the claims:

1. (PREVIOUSLY PRESENTED) An apparatus comprising:

an optical transmitter comprising

a light source emitting a light,

a modulation signal generator generating an electrical modulation signal having a corresponding rise time and fall time,

an adjusting circuit adjusting at least one of the rise time and fall time of the electrical modulation signal, and

a modulator modulating the emitted light with the adjusted electrical modulation signal, the optical transmitter transmitting the modulated light to an optical transmission path; and

a receiver receiving the transmitted, modulated light through the optical transmission path, wherein the adjusting circuit adjusts at least one of the rise time and fall time in accordance with characteristics of the modulated light at the receiver.

2. (CANCELED)

3. (CANCELED)

4. (CANCELED)

5. (PREVIOUSLY PRESENTED) An apparatus as in claim 1, wherein the adjusting circuit adjusts both the rise time and the fall time.

6. (PREVIOUSLY PRESENTED) An apparatus as in claim 1, wherein the adjusting circuit lengthens both the rise time and the fall time.

7. (PREVIOUSLY PRESENTED) An apparatus as in claim 1, wherein the adjusting circuit shortens both the rise time and the fall time.

8. (PREVIOUSLY PRESENTED) An apparatus as in claim 1, wherein the adjusting circuit adjusts both the rise time and the fall time to maintain amplitude deterioration and phase margin of the transmitted modulated light within a specific range.

9. (CANCELED)

10. (CANCELED)

11. (PREVIOUSLY PRESENTED) An apparatus as in claim 1, wherein the adjusting circuit performs one of

lengthening both the rise time and the fall time in accordance with the characteristics of the transmitted modulated light at the receiver,

shortening both the rise time and the fall time in accordance with the characteristics of the transmitted modulated light at the receiver, and

adjusting both the rise time and the fall time to maintain amplitude deterioration and phase margin of the transmitted modulated light within a specific range in accordance with the characteristics of the transmitted modulated light at the receiver.

12. (PREVIOUSLY PRESENTED) An apparatus as in claim 1, further comprising:

a controller controlling the adjusting circuit to adjust said at least one of the rise time and fall time in accordance with the characteristics of the transmitted modulated light at the receiver.

13. (PREVIOUSLY PRESENTED) An apparatus as in claim 1, wherein the modulator modulates the emitted light via one of the group consisting of optical phase modulation and optical frequency modulation.

14. (PREVIOUSLY PRESENTED) An apparatus as in claim 1, further comprising:

a dispersion compensator compensating for wavelength dispersion characteristics of the optical transmission path.

15. (PREVIOUSLY PRESENTED) An apparatus as in claim 1, further comprising:

a plurality of said optical transmitters, each transmitting a respective modulated light having a different wavelength than the modulated lights of the other optical transmitters; and

an optical multiplexer multiplexing the modulated lights together into a wavelength division multiplexed (WDM) signal which is transmitted through the optical transmission path.

16. (PREVIOUSLY PRESENTED) An apparatus comprising:

an adjusting circuit adjusting at least one of a rise time and a fall time of an electrical

modulation signal; and

a modulator modulating a light with the adjusted electrical modulation signal, wherein the adjusting circuit adjusts said at least one of the rise time and the fall time in accordance with characteristics of the modulated light as received by a receiver through an optical transmission path.

17. (ORIGINAL) An apparatus as in claim 16, wherein the adjusting circuit adjusts both the rise time and the fall time.

18. (ORIGINAL) An apparatus as in claim 16, wherein the adjusting circuit lengthens both the rise time and the fall time.

19. (ORIGINAL) An apparatus as in claim 16, wherein the adjusting circuit shortens both the rise time and the fall time.

20. (PREVIOUSLY PRESENTED) An apparatus as in claim 16, wherein the adjusting circuit adjusts both the rise time and the fall time to maintain amplitude deterioration and phase margin of the modulated light within a specific range.

21. (CANCELED)

22. (PREVIOUSLY PRESENTED) An apparatus as in claim 16, further comprising:

a controller controlling the adjusting circuit to adjust said at least one of the rise time and fall time in accordance with the characteristics of the modulated light at the receiver.

23. (ORIGINAL) An apparatus as in claim 16, wherein the modulator modulates the light via one of the group consisting of optical phase modulation and optical frequency modulation.

24. (PREVIOUSLY PRESENTED) An apparatus as in claim 16, further comprising:

a dispersion compensator compensating for wavelength dispersion characteristics of the optical transmission path.

25. (ORIGINAL) An apparatus as in claim 16, wherein the adjusting circuit comprises:

a electrical amplifier amplifying the electrical modulation signal; and

a filter filtering the amplified electrical modulation signal.

26. (PREVIOUSLY PRESENTED) An optical communication system comprising:

a transmitter including an adjusting circuit adjusting at least one of a rise time and a fall time of an electrical modulation signal, and a modulator modulating a light with the adjusted electrical modulation signal, the transmitter transmitting the modulated light through an optical transmission path;

a receiver receiving the transmitted, modulated light through the optical transmission path; and

a controller controlling the adjusting circuit to adjust said at least one of the rise time and fall time in accordance with characteristics of the modulated light at the receiver.

27. (PREVIOUSLY PRESENTED) An optical communication system as in claim 26, wherein the controller controls the adjusting circuit to perform one of:

lengthening both the rise time and the fall time in accordance with characteristics of the modulated light at the receiver,

shortening both the rise time and the fall time in accordance with characteristics of the modulated light at the receiver, and

adjusting both the rise time and the fall time to maintain amplitude deterioration and phase margin of the modulated light within a specific range in accordance with characteristics of the modulated light at the receiver.

28. (PREVIOUSLY PRESENTED) An apparatus comprising:

an adjusting circuit adjusting at least one of a rise time and a fall time of a modulation signal; and

a modulator modulating a light with the adjusted modulation signal, wherein the adjusting circuit adjusts said at least one of the rise time and the fall time in accordance with characteristics of the modulated light as received by a receiver through an optical transmission path.

29. (PREVIOUSLY PRESENTED) An apparatus as in claim 28, wherein the adjusting

circuit performs one of :

adjusting both the rise time and the fall time,

lengthening both the rise time and the fall time, and

shortening both the rise time and the fall time.

30. (CANCELED)

31. (PREVIOUSLY PRESENTED) An apparatus as in claim 28, further comprising:

a controller controlling the adjusting circuit to adjust said at least one of the rise time and fall time in accordance with the characteristics of the modulated light at the receiver.

32. (ORIGINAL) An apparatus as in claim 28, wherein the adjusting circuit comprises:

an amplifier amplifying the modulation signal; and

a filter filtering the amplified modulation signal.

33. (PREVIOUSLY PRESENTED) A method comprising:

adjusting at least one of a rise time and a fall time of an electrical modulation signal;

modulating a light with the adjusted electrical modulation signal; and

transmitting the modulated light through an optical transmission path, wherein said adjusting adjusts at least one of the rise time and the fall time in accordance with characteristics of the modulated light as received by a receiver through the optical transmission path.

34. (CANCELED)

35. (PREVIOUSLY PRESENTED) A method comprising:

adjusting at least one of a rise time and a fall time of a modulation signal;

modulating a light with the adjusted modulation signal;

transmitting the modulated light through an optical transmission path; and

receiving the transmitted, modulated light from the optical transmission path, wherein said adjusting adjusts said at least one of the rise time and the fall time in accordance with characteristics of the transmitted, modulated light as received by said receiving.

36. (CANCELED)

37. (PREVIOUSLY PRESENTED) An apparatus comprising:

means for adjusting at least one of a rise time and a fall time of a modulation signal; and

a modulator modulating a light with the adjusted modulation signal, wherein said means adjusts said at least one of the rise time and the fall time in accordance with characteristics of the modulated light as received by a receiver through an optical transmission path.

38. (PREVIOUSLY PRESENTED) An apparatus comprising:

a plurality of transmitting devices, each comprising

a light source emitting a light,

a modulation signal generator generating an electrical modulation signal having a corresponding rise time and fall time,

an adjusting circuit adjusting at least one of the rise time and fall time of the electrical modulation signal, and

a modulator modulating the emitted light with the adjusted electrical modulation signal, the emitted light of each light source being at a different wavelength than the emitted light of the other light sources so that the plurality of transmitting devices thereby produce a plurality of modulated lights, respectively, at different wavelengths; and

an optical multiplexer multiplexing the plurality of modulated lights into a wavelength division multiplexed (WDM) light wherein, in each transmitting device, the adjusting circuit of the respective transmitting device adjusts at least one of the rise time and fall time in accordance with characteristics of the modulated light of the respective transmitting device at a receiver receiving the respective modulated light from the WDM light.

39. (PREVIOUSLY PRESENTED) An apparatus comprising:

a light source emitting a light,

a modulation signal generator generating an electrical modulation signal having a corresponding rise time and fall time,

an adjusting circuit adjusting at least one of the rise time and fall time of the electrical modulation signal,

a modulator modulating the emitted light with the adjusted electrical modulation signal, to thereby produce a modulated light; and

an optical multiplexer multiplexing the modulated light with lights at different wavelengths

than the light emitted by the light source, to thereby produce a wavelength division multiplexed (WDM) light, wherein the adjusting circuit adjusts at least one of the rise time and fall time in accordance with characteristics of the modulated light at a receiver receiving the modulated light from the WDM light.